

**FEHER'S QUADRATURE PHASE SHIFT KEYING (FQPSK) TRANSCEIVER  
AND METHOD FOR TRANSMITTING, RECEIVING, AND PROCESSING  
SIGNALS THEREWITH**

**ABSTRACT**

Spectral efficient transmitters-receivers (transceivers), high performance Bit Rate Agile (BRA) modulation-demodulation (Modem) methods and integrated Modems/Transceivers suitable for operation over Non-Linearly Amplified (NLA) power efficient RF systems for enhanced performance and increased capacity bandwidth efficient wireless, PCS, cellular CDMA, TDMA, GSM, OFDM and other efficient communications, broadcasting and telemetry systems are described. Cross-correlated cascaded Time Constrained Signal (TCS) response processors and Long Response (LR) filtered Bit Rate Agile (BRA) in phase (I) and quadrature phase (Q) baseband signals are disclosed. These spectral efficient high performance processing, transmitting and receiving methods are designated as Feher's Quadrature Phase Shift Keying (FQPSK) Transceivers. Integrated Modem and transceiver technologies, disclosed herein and designated as Feher's Quadrature Amplitude Modulation (FQAM), Feher's Gaussian Minimum Shift Keying (FGMSK) and Feher's Minimum Shift Keying (FMSK) are subsets of 2nd generation FQPSK systems. Bit rate and RF agile cascaded mis-matched (ACM) demodulation filters Miss-Matched (MM) to that of the modulator filters, Modem Format Selectable (MFS) and Code Selectable (CS) methods for tunable RF frequency embodiments are described. The 2nd generation of FQPSK systems with Adaptive Antenna Arrays (AAA), Pseudo-Error (PE) based Non-Redundant Error Detection (NRED) and PE controlled IF adaptive Feher Equalizers (FE) and smart diversity systems has additional enhanced spectral/RF power efficiency and end-to-end performance advantages.